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CLAIMS

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What is claimed is:

1. A method for injecting a control cell into an established Asynchronous Transfer Mode (ATM) data connection between a source device and a destination device, wherein said control cell is injected into said connection by a control point of an injection switching node, said method comprising:

generating a control cell composed of a payload and an ATM header containing an input Virtual Path/Virtual Circuit of said connection in order to constitute an ATM cell;

encoding a switch routing label (SRL) and a protocol engine correlator (PEC) within said control cell; and

setting an injection flag within said control cell for indicating to an input protocol engine of said control point that said control cell is to be injected into said connection.

2. The method of claim 1, wherein said input protocol engine identifies incoming cells by performing a label lookup, and wherein said method further comprises:

reading said injection flag within said protocol engine; and

bypassing said label lookup in view of said injection flag.

1 3. The method of claim 1, wherein said protocol engine
2 appends routing labels to non-control ATM traffic cells,
3 and wherein said method further comprises:

4 reading said injection flag within said protocol
5 engine; and

6 bypassing said routing label append function in view
7 of said injection flag.

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1 4. A method for extracting a control cell from an
2 established Asynchronous Transfer Mode (ATM) data
3 connection setup between a source device and a
4 destination device, wherein said control cell is
5 extracted from said connection by a control point of an
6 extraction switching node, said method comprising:

7 determining within said extraction switching node
8 whether or not an incoming control cell includes an
9 extraction condition; and

10 setting a control flag within said incoming control
11 cell in response to said cell including an extraction
12 condition, such that said extraction switching node
13 recognizes and extracts said incoming cell.

14 5. The method of claim 4, further comprising:

15 within an input adapter and prior to transmitting
16 said control cell to a switch:

17 adding a control point switch routing label to said
18 control cell, wherein said switch routing label
19 corresponds to said control point; and

20 adding a reserved static protocol engine correlator
21 to said control cell.

22 6. The method of claim 5, wherein said control point
23 switch routing label and adding a static protocol engine
24 correlator are loaded into a register of said input
25 adapter during initialization of said extraction
26 switching node.

1 7. The method of claim 6, wherein said static protocol
2 engine correlator is generated by encoding the identity
3 of said input adapter and the identity of the input port
4 at which said control cell is received in said input
5 adapter.

1 8. The method of claim 4, further comprising:

2 switching said control cell across a switch within
3 said extraction switching node; and

4 setting an extraction flag in said control cell
5 after said switching step.

6 9. The method of claim 8, further comprising setting
7 said extraction flag in response to a routing label
8 lookup within an output protocol engine.

9 10. The method of 9, wherein said output protocol engine
10 performs label swapping for outgoing cells, said method
11 further comprising:

12 reading said extraction flag; and

13 bypassing said label swapping in view of said
14 extraction flag, such that said control cell includes an
15 input Virtual Path/Virtual Circuit and source and input
16 adapter identifications.

1 11. A system for injecting a control cell into an
2 established Asynchronous Transfer Mode (ATM) data
3 connection between a source device and a destination
4 device, wherein said control cell is injected into said
5 connection by a control point of an injection switching
6 node, said system comprising:

7 processing means for generating a control cell
8 composed of a payload and an ATM header containing an
9 input Virtual Path/Virtual Circuit of said connection in
10 order to constitute an ATM cell;

11 processing means for encoding a switch routing label
12 (SRL) and a protocol engine correlator (PEC) within said
13 control cell; and

14 processing means for setting an injection flag
15 within said control cell for indicating to an input
16 protocol engine of said control point that said control
17 cell is to be injected into said connection.

18 12. The system of claim 11, wherein said input protocol
19 engine identifies incoming cells by performing a label
20 lookup, and wherein said system further comprises:

21 processing means for reading said injection flag
22 within said protocol engine; and

23 processing means for bypassing said label lookup in
24 view of said injection flag.

1 13. The system of claim 11, wherein said protocol engine
2 appends routing labels to non-control ATM traffic cells,
3 and wherein said system further comprises:

4 processing means for reading said injection flag
5 within said protocol engine; and

6 processing means for bypassing said routing label
7 append function in view of said injection flag.

1 14. A system for extracting a control cell from an
2 established Asynchronous Transfer Mode (ATM) data
3 connection setup between a source device and a
4 destination device, wherein said control cell is
5 extracted from said connection by a control point of an
6 extraction switching node, said system comprising:

7 processing means for determining within said
8 extraction switching node whether or not an incoming
9 control cell includes an extraction condition; and

10 processing means for setting a control flag within
11 said incoming control cell in response to said cell
12 including an extraction condition, such that said
13 extraction switching node recognizes and extracts said
14 incoming cell.

15. The system of claim 14, further comprising:

1 within an input adapter;

3 processing means for adding a control point switch
4 routing label to said control cell, wherein said switch
5 routing label corresponds to said control point; and

6 processing means for adding a reserved static
7 protocol engine correlator to said control cell.

1 16. The system of claim 15, wherein said control point
2 switch routing label and adding a static protocol engine
3 correlator are loaded into a register of said input

4 adapter during initialization of said extraction
5 switching node.

1 17. The system of claim 16, further comprising
2 processing means for encoding the identity of said input
3 adapter and the identity of the input port at which said
4 control cell is received in said static protocol engine
5 correlator.

1 18. The system of claim 14, further comprising:

processing means for switching said control cell
across a switch within said extraction switching node;
and

processing means for setting an extraction flag in
said control cell after said control cell has been
switched.

1 19. The system of claim 18, further comprising
2 processing means for setting said extraction flag in
3 response to a routing label lookup within an output
4 protocol engine.

1 20. The system of 19, wherein said output protocol
2 engine performs label swapping for outgoing cells, said
3 system further comprising:

4 processing means for reading said extraction flag;
5 and

6 processing means for bypassing said label swapping
7 in view of said extraction flag, such that said control

8 cell includes an input Virtual Path/Virtual Circuit and
9 source and input adapter identifications.